

## WEST Search History

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DATE: Monday, January 31, 2005

Hide?	Set Name	Query	Hit Count
		<i>DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=ADJ</i>	
<input type="checkbox"/>	L2	(formohydroxamic acid\$1) or (formylhydroxamic acid\$1)	0
<input type="checkbox"/>	L1	formohydroxamic acid\$1	19

END OF SEARCH HISTORY

## WEST Search History

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DATE: Sunday, January 30, 2005

Hide?	Set Name	Query	Hit Count
		<i>DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=ADJ</i>	
<input type="checkbox"/>	L9	17 and 18	27
<input type="checkbox"/>	L8	photoresist\$1 or semiconductor\$1	1544373
<input type="checkbox"/>	L7	16 and 14	746
<input type="checkbox"/>	L6	hydroxy\$5 near5 amide\$1	22619
<input type="checkbox"/>	L5	13 and 14	830
<input type="checkbox"/>	L4	510/\$.ccls.	39503
<input type="checkbox"/>	L3	hydroxy\$1 near10 amide\$1	28940
<input type="checkbox"/>	L2	N-hydroxyformamide\$1 or hydroxyformamide\$1	49
<input type="checkbox"/>	L1	N-hydroxyformamide\$1	40

END OF SEARCH HISTORY

=> file reg		
COST IN U.S. DOLLARS	SINCE FILE	TOTAL
	ENTRY	SESSION
FULL ESTIMATED COST	0.21	0.21

FILE 'REGISTRY' ENTERED AT 15:31:05 ON 31 JAN 2005  
 USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.  
 PLEASE SEE "HELP USAGETERMS" FOR DETAILS.  
 COPYRIGHT (C) 2005 American Chemical Society (ACS)

Property values tagged with IC are from the ZIC/VINITI data file  
 provided by InfoChem.

STRUCTURE FILE UPDATES: 30 JAN 2005 HIGHEST RN 823177-37-3  
 DICTIONARY FILE UPDATES: 30 JAN 2005 HIGHEST RN 823177-37-3

TSCA INFORMATION NOW CURRENT THROUGH MAY 21, 2004

Please note that search-term pricing does apply when  
 conducting SmartSELECT searches.

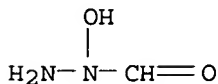
Crossover limits have been increased. See HELP CROSSOVER for details.

Experimental and calculated property data are now available. For more  
 information enter HELP PROP at an arrow prompt in the file or refer  
 to the file summary sheet on the web at:  
<http://www.cas.org/ONLINE/DBSS/registryss.html>

=> s hydroxyformamide  
 L1 34 HYDROXYFORMAMIDE

=> d 31-34

L1 ANSWER 31 OF 34 REGISTRY COPYRIGHT 2005 ACS on STN  
 RN 167903-31-3 REGISTRY  
 CN Hydrazinecarboxaldehyde, 1-hydroxy- (9CI) (CA INDEX NAME)  
 OTHER NAMES:  
 CN **N-Amino-N-hydroxyformamide**  
 FS 3D CONCORD  
 MF C H4 N2 O2  
 SR CA  
 LC STN Files: CA, CAPLUS  
 DT.CA Caplus document type: Journal  
 RL.NP Roles from non-patents: PROC (Process); PRP (Properties); RACT  
 (Reactant or reagent)



\*\*PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT\*\*

1 REFERENCES IN FILE CA (1907 TO DATE)  
 1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

L1 ANSWER 32 OF 34 REGISTRY COPYRIGHT 2005 ACS on STN  
 RN 67607-62-9 REGISTRY  
 CN **L-Tryptophan, compd. with N-hydroxyformamide (1:1) (9CI)** (CA

INDEX NAME)

OTHER CA INDEX NAMES:

CN Formamide, N-hydroxy-, compd. with L-tryptophan (1:1) (9CI)

FS STEREOSEARCH

MF C11 H12 N2 O2 . C H3 N O2

LC STN Files: CA, CAPLUS

DT.CA Caplus document type: Journal

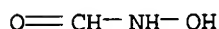
RL.NP Roles from non-patents: ANST (Analytical study)

RLD.NP Roles for non-specific derivatives from non-patents: RACT (Reactant or reagent)

CM 1

CRN 4312-87-2

CMF C H3 N O2

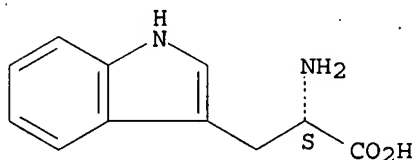


CM 2

CRN 73-22-3

CMF C11 H12 N2 O2

Absolute stereochemistry.



1 REFERENCES IN FILE CA (1907 TO DATE)

1 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA

1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

L1 ANSWER 33 OF 34 REGISTRY COPYRIGHT 2005 ACS on STN

RN 57470-05-0 REGISTRY

CN Formamide, N-(4-chlorophenyl)-N-hydroxy-, compd. with N-[3,5-bis(1,1-dimethylethyl)phenyl]-N'-(4-chlorophenyl)methanimidamide N'-oxide (1:1) (9CI) (CA INDEX NAME)

OTHER CA INDEX NAMES:

CN **Methanimidamide, N-[3,5-bis(1,1-dimethylethyl)phenyl]-N'-(4-chlorophenyl)-, N'-oxide, compd. with N-(4-chlorophenyl)-N-hydroxyformamide (1:1) (9CI)**

MF C21 H27 Cl N2 O . C7 H6 Cl N O2

LC STN Files: BEILSTEIN\*, CA, CAPLUS

(\*File contains numerically searchable property data)

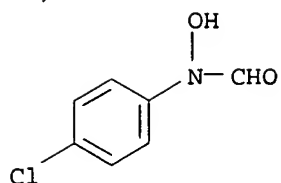
DT.CA Caplus document type: Journal

RL.NP Roles from non-patents: PREP (Preparation)

CM 1

CRN 57470-04-9

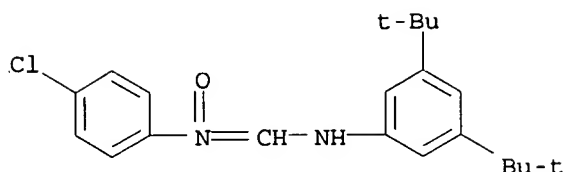
CMF C7 H6 Cl N O2



CM 2

CRN 57470-02-7

CMF C21 H27 Cl N2 O



1 REFERENCES IN FILE CA (1907 TO DATE)

1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

L1 ANSWER 34 OF 34 REGISTRY COPYRIGHT 2005 ACS on STN

RN 4312-87-2 REGISTRY

CN Formamide, N-hydroxy- (9CI) (CA INDEX NAME)

OTHER CA INDEX NAMES:

CN Formohydroxamic acid (6CI, 7CI, 8CI)

OTHER NAMES:

CN Formohydroxamic acid

CN Formylhydroxamic acid

CN Formylhydroxylamine

CN N-Formylhydroxylamine

CN **N-Hydroxyformamide**

CN NSC 101638

FS 3D CONCORD

DR 455280-74-7

MF C H3 N O2

CI COM

LC STN Files: BEILSTEIN\*, BIOSIS, CA, CAOLD, CAPLUS, CASREACT, EMBASE, GMELIN\*, IFICDB, IFIPAT, IFIUDB, MEDLINE, RTECS\*, SPECINFO, TOXCENTER, USPATFULL

(\*File contains numerically searchable property data)

DT.CA Caplus document type: Conference; Dissertation; Journal; Patent; Report

RL.P Roles from patents: ANST (Analytical study); PREP (Preparation); PROC (Process); PRP (Properties); RACT (Reactant or reagent); USES (Uses); NORL (No role in record)

RLD.P Roles for non-specific derivatives from patents: BIOL (Biological study); PREP (Preparation); PROC (Process); USES (Uses)

RL.NP Roles from non-patents: BIOL (Biological study); FORM (Formation, nonpreparative); PREP (Preparation); PROC (Process); PRP (Properties); RACT (Reactant or reagent); USES (Uses); NORL (No role in record)

RLD.NP Roles for non-specific derivatives from non-patents: ANST (Analytical study); BIOL (Biological study); FORM (Formation, nonpreparative); OCCU (Occurrence); PREP (Preparation); PROC (Process); PRP (Properties); RACT (Reactant or reagent); USES (Uses)

O=CH-NH-OH

\*\*PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT\*\*

196 REFERENCES IN FILE CA (1907 TO DATE)  
44 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA  
196 REFERENCES IN FILE CAPLUS (1907 TO DATE)  
17 REFERENCES IN FILE CAOLD (PRIOR TO 1967)

=> sel chem 34  
E1 THROUGH E9 ASSIGNED

=> file .jrh

COST IN U.S. DOLLARS

SINCE FILE

TOTAL

ENTRY

SESSION

FULL ESTIMATED COST

13.57

13.78

FILE 'USPATFULL' ENTERED AT 15:32:41 ON 31 JAN 2005  
CA INDEXING COPYRIGHT (C) 2005 AMERICAN CHEMICAL SOCIETY (ACS)

FILE 'CAPLUS' ENTERED AT 15:32:41 ON 31 JAN 2005  
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COPYRIGHT (C) 2005 AMERICAN CHEMICAL SOCIETY (ACS)

FILE 'IFIPAT' ENTERED AT 15:32:41 ON 31 JAN 2005  
COPYRIGHT (C) 2005 IFI CLAIMS(R) Patent Services (IFI)

FILE 'JAPIO' ENTERED AT 15:32:41 ON 31 JAN 2005  
COPYRIGHT (C) 2005 Japanese Patent Office (JPO)- JAPIO

=> s e1-9

3 FILES SEARCHED...

L2 347 ("FORMOHYDROXAMIC ACID"/BI OR "FORMOHYDROXIMIC ACID"/BI OR "FORMYLHYDROXAMIC ACID"/BI OR FORMYLHYDROXYLAMINE/BI OR N-FORMYLHYDROXYLAMINE/BI OR N-HYDROXYFORMAMIDE/BI OR "NSC 101638"/BI OR 4312-87-2/BI OR 455280-74-7/BI)

=> s l2 (p) (cleaning or laundry)

L3 3 L2 (P) (CLEANING OR LAUNDRY)

=> d 1-3 hit

L3 ANSWER 1 OF 3 USPATFULL on STN

AB The **cleaning** composition of the present invention is characterized by containing **N-hydroxyformamide**. The **cleaning** composition is capable of easily removing patterned photoresist masks or resist residues remaining on substrates after the etching process or removing resist residues remaining after the etching process and the subsequent ashing process within a short period of time without causing the corrosion of wiring materials and insulating films, thereby ensuring the fine processing to provide high-precision wiring circuits.

SUMM. [0009] As a result of extensive study in view of achieving the above object, the inventor has found that a **cleaning** composition containing **N-hydroxyformamide** removes resist residues, etc. easily within a short period of time without causing the corrosion of wiring materials and insulating films, thereby ensuring the fine processing to provide high-precision wiring circuits.

- SUMM [0010] Thus, the present invention provides a **cleaning** composition containing **N-hydroxyformamide**.
- SUMM [0012] The **cleaning** composition of the present invention for **cleaning** substrates contains **N-hydroxyformamide** represented by the following formula (2):  
##STR1##
- SUMM [0015] The resist stripping capability of the **cleaning** composition of the present invention can be enhanced by the use of **N-hydroxyformamide** in combination with an alkaline compound. Since the **cleaning** composition is to be used in the production of semiconductors, etc., it is preferred for the alkaline compound to include no metallic element. The alkaline compound may include ammonia, alkylamines, alkanolamines, polyamines, hydroxylamine compounds, cyclic amines, quaternary ammonium salts.
- SUMM [0031] The **cleaning** composition may further contain an amine polymer having an average molecular weight of 250 or more. The amine polymer is very effective for preventing the corrosion of silicon, aluminum, aluminum alloy, copper, copper alloy and tungsten, and provides a non-corrosive composition when used in combination with **N-hydroxyformamide** (formhydroxamic acid). Such a composition is extremely effective for preventing the corrosion of silicon, and very effective for preventing the corrosion of copper. The amine polymer may contain nitrogen atoms in either of side chains or backbone chains. The upper limit of the molecular weight is not strictly limited, but an excessively large molecular weight makes the amine polymer less miscible with other components of the **cleaning** composition. Therefore, the upper limit of the molecular weight is preferably 100,000. The amine polymer may be in the free form or the salt form, and may be suitably selected depending on the purpose. Preferred are the free form and the organic acid salt form.
- SUMM [0035] The **cleaning** composition of the present invention may further contain a hydroxymethylamino compound represented by the following formula (1). The hydroxymethylamino compound enhances the stripping capability to organic resists. Therefore, by the use of the hydroxymethylamino compound in combination with **N-hydroxyformamide**, resists and resist residues are both effectively removed. ##STR3##
- DETD [0051] The semiconductor substrate was immersed at 70° C. for 30 min in a **cleaning** composition comprising 30% by weight of ethanolamine, 5% by weight of **N-hydroxyformamide**, 45% by weight of N-methylpyrrolidone, 19.999% by weight of water and 0.001% by weight of polyallylamine (molecular weight: 2000). After successively rinsed with isopropanol and super pure water and dried, the substrate was observed under a scanning electron microscope (SEM).
- DETD [0063] In these examples and comparative examples, the production of a thin film transistor was simulated. On a glass substrate, two low-temperature polysilicon layers (about 300 Å thick) having an intervening SiO<sub>2</sub> layer were formed. Further disposed thereon was an insulating layer on which resists remained. The insulating layer was partly removed to cause a part of the polysilicon layers to be exposed to direct contact with the **cleaning** composition for resist stripping. The substrate was immersed at 40° C. for 15 min in each **cleaning** composition shown in Table 4, rinsed with water, dried by blowing nitrogen gas, and the observed under an optical microscope to evaluate the resist removal and the corrosion of the polysilicon layer. The results are shown in Table 4.

## Compositions

Resist  
Removal

Corrosion

## Examples

17	ethanolamine	5 wt %	removed	none
	N-methylpyrrolidone	74.9 wt %		
	polyethyleneimine	0.1 wt %		
	(MW = 10000)			
	<b>N-hydroxyformamide</b>	1 wt %		
	water	20 wt %		
18	isopropanolamine	3 wt %	removed	none
	dimethylacetamide	60 wt %		
	polyallylamine	0.01 wt %		
	(MW = 3000)			
	<b>N-hydroxyformamide</b>	1 wt %		
	water	34.99 wt %		
	N-hdroxymethylamino-2-propanol	1 wt %		
19	aminoethylaminoethanol	30 wt %	removed	none
	<b>N-hydroxyformamide</b>	1 wt %		
	dipropylene glycol	69 wt %		
	monomethyl ether			
20	dimethylaminoethanol	94 wt %	removed	none
	<b>N-hydroxyformamide</b>	1 wt %		
	methylolurea	2 wt %		
	water	3 wt %		

## Comparative Examples

7	N-methylpyrrolidone	75 wt %	removed	corroded
	water	20 wt %		
	ethanolamine	5 wt %		
8	isopropanolamine	3 wt %	not	corroded
	dimethylacetamide	62 wt %	removed	
	water	35 wt %		

CLM What is claimed is:

1. A **cleaning** composition comprising a **N-hydroxyformamide**.

2. The **cleaning** composition according to claim 1, wherein the content of the **N-hydroxyformamide** is 0.001 to 95% by weight.

L3 ANSWER 2 OF 3 CAPLUS COPYRIGHT 2005 ACS on STN

AB The composition comprises a **N-hydroxyformamide** and an alkaline compound, such as amines or amine polymers. The **cleaning** composition is capable of easily removing patterned photoresist masks or resist residues remaining on substrates after the etching process and the subsequent ashing process within a short period of time without causing the corrosion of wiring materials and insulating films to ensure the fine processing to provide high-precision wiring circuits. Thus, a SiO<sub>2</sub>/Ti/TiN/Al-Cu/TiN laminate was applied with a resist composition, patterned, dry etched and ashed, and immersed in a **cleaning** composition containing **N-hydroxyformamide** 15, ethanolamine 70 and water 15% at 70° for 30 min, showing the resist completely removed.

IT 75-59-2, Tetramethylammonium hydroxide 78-96-6, Isopropanolamine 108-01-0, Dimethylaminoethanol 109-83-1, N-Methylethanolamine 111-42-2, Diethanolamine, uses 127-19-5, Dimethylacetamide 141-43-5, Ethanolamine, uses 872-50-4, N-Methylpyrrolidone, uses 929-06-6 1000-82-4, Methylolurea 1121-83-1, 2-Oxazolidinone, 5,5-dimethyl-

4312-87-2, N-Hydroxyformamide 7803-49-8D,  
Hydroxyamine, derivs. 9002-98-6 30551-89-4, Polyallylamine  
65184-12-5 70495-38-4 76733-35-2  
RL: TEM (Technical or engineered material use); USES (Uses)  
(cleaning comps. for removing photoresist masks or resist  
residues on substrates)

L3 ANSWER 3 OF 3 IFIPAT COPYRIGHT 2005 IFI on STN

AB The **cleaning** composition of the present invention is characterized by containing **N-hydroxyformamide**. The **cleaning** composition is capable of easily removing patterned photoresist masks or resist residues remaining on substrates after the etching process or removing resist residues remaining after the etching process and the subsequent ashing process within a short period of time without causing the corrosion of wiring materials and insulating films, thereby ensuring the fine processing to provide high-precision wiring circuits.

ECLM 1. A **cleaning** composition comprising a **N-hydroxyformamide**.

ACLM 2. The **cleaning** composition according to claim 1, wherein the content of the **N-hydroxyformamide** is 0.001 to 95% by weight.

3. The **cleaning** composition according to claim 1, further comprising an alkaline compound.

4. The **cleaning** composition according to claim 3, wherein the alkaline compound is free from metallic element.

5. The **cleaning** composition according to claim 3, wherein the alkaline compound is at least one compound selected from the group consisting of alkyl amines, alkanol amines, polyamines, hydroxyl amine compounds, cyclic amines, and quaternary ammonium salts.

6. The **cleaning** composition according to claim 1, further comprising an organic solvent.

7. The **cleaning** composition according to claim 1, further comprising a corrosion inhibitor.

8. The **cleaning** composition according to claim 1, further comprising an amine polymer having an average molecular weight of 250 or more.

9. The **cleaning** composition according to claim 8, wherein the amine polymer is at least one polymer selected from the group consisting of polyallylamines, polyethyleneimines and polyvinylamines.

10. The **cleaning** composition according to claim 1, further comprising a compound having a hydroxymethylamino structure represented by the following formula (1):

D R A W I N G

wherein R1 and R2 are each independently hydrogen or substituent having 1 to 12 carbon atoms, R1 and R2 optionally being bonded to each other to form together with nitrogen a ring structure having 2 to 12 carbon atoms.

11. The **cleaning** composition according to claim 1, further comprising water.

12. A method for **cleaning** a substrate of semiconductor integrated circuits or liquid crystal display devices, the method comprising a step of bringing the substrate into contact with the **cleaning** composition as defined in claim 1.

=> d 1-3 ibib

L3 ANSWER 1 OF 3 USPATFULL on STN

ACCESSION NUMBER: 2004:64242 USPATFULL

TITLE: Cleaning composition

INVENTOR(S): Ikemoto, Kazuto, Tokyo, JAPAN

NUMBER            KIND            DATE

PATENT INFORMATION: US 2004048761 A1 20040311  
 APPLICATION INFO.: US 2003-654997 A1 20030905 (10)

	NUMBER	DATE
PRIORITY INFORMATION:	JP 2002-263342	20020909
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	APPLICATION	
LEGAL REPRESENTATIVE:	ANTONELLI, TERRY, STOUT & KRAUS, LLP, 1300 NORTH SEVENTEENTH STREET, SUITE 1800, ARLINGTON, VA, 22209-9889	
NUMBER OF CLAIMS:	12	
EXEMPLARY CLAIM:	1	
LINE COUNT:	573	
CAS INDEXING IS AVAILABLE FOR THIS PATENT.		

L3 ANSWER 2 OF 3 CAPLUS COPYRIGHT 2005 ACS on STN  
 ACCESSION NUMBER: 2004:203532 CAPLUS  
 DOCUMENT NUMBER: 140:237577  
 TITLE: Cleaning compositions for removing photoresist masks  
 or resist residues on substrates and their cleaning  
 method  
 INVENTOR(S): Ikemoto, Kazuto  
 PATENT ASSIGNEE(S): Japan  
 SOURCE: U.S. Pat. Appl. Publ., 7 pp.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2004048761	A1	20040311	US 2003-654997	20030905
JP 2004101849	A2	20040402	JP 2002-263342	20020909
CN 1488740	A	20040414	CN 2003-159130	20030909
PRIORITY APPLN. INFO.:			JP 2002-263342	A 20020909
OTHER SOURCE(S):	MARPAT 140:237577			

L3 ANSWER 3 OF 3 IFIPAT COPYRIGHT 2005 IFI on STN  
 AN 10541543 IFIPAT;IFIUDB;IFICDB  
 TITLE: CLEANING COMPOSITION  
 INVENTOR(S): Ikemoto; Kazuto, Tokyo, JP  
 PATENT ASSIGNEE(S): Unassigned  
 AGENT: ANTONELLI, TERRY, STOUT & KRAUS, LLP, 1300 NORTH  
 SEVENTEENTH STREET, SUITE 1800, ARLINGTON, VA,  
 22209-9889, US

	NUMBER	PK	DATE
PATENT INFORMATION:	US 2004048761	A1	20040311
APPLICATION INFORMATION:	US 2003-654997		20030905

	NUMBER	DATE
PRIORITY APPLN. INFO.:	JP 2002-263342	20020909
FAMILY INFORMATION:	US 2004048761	20040311
DOCUMENT TYPE:	Utility Patent Application - First Publication	
FILE SEGMENT:	CHEMICAL APPLICATION	

NUMBER OF CLAIMS: 12

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L4 1 DUP REM L3 (2 DUPLICATES REMOVED)

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DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)	SINCE FILE	TOTAL
	ENTRY	SESSION
CA SUBSCRIBER PRICE	-0.73	-0.73

STN INTERNATIONAL LOGOFF AT 15:35:20 ON 31 JAN 2005